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8 August 1963

MEMORANDUM FOR THE RECORD

SUBJECT : OXCART - Engine Foreign Object Damage

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1. Since the 6 May 1963 Foreign Object Damage (FOD) Review Meeting at [] attended by the EECI, there have been five instances of known J58 engine FOD in the A-12 and AF-12 aircraft. Three of these five instances occurred prior to aircraft first flight, two involving the AF-12 aircraft #1001 and one involving the A-12 aircraft #127.

2. The only known major J58 engine FOD requiring engine overhaul is the last mentioned above and was sustained 2 August in the left nacelle of aircraft 127 during ground runs prior to first flight in spite of stringent personnel and quality control measures and cleaning procedures implemented as a result of the 6 May meeting. It should be recalled that aircraft 127 was the last A-12 assembled in Burbank prior to implementation of the nacelle shake operations, designed to remove foreign material prior to final assembly. This procedure is effective with aircraft 128 and up.

3. One of the five instances of J58 engine FOD, minor in nature and already repaired in the field, was sustained 3 August in the right nacelle of aircraft 125 during pre-flight but after 8 hours and 43 minutes of damage-free flight time. This damage is reportedly attributed to the failure of a ground test exhaust noise suppressor and therefore was not induced by the aircraft itself.

4. Up to the 6 May 1963 meeting, 143 hours of installed J58 engine time had been accumulated since initiation of the flight test program. During this period fourteen J58 engines suffered FOD with eight of these being major damages. For this period, this reflects a mean time between J58 FOD of 10.2 hours and a mean time between major J58 FOD of 17.9 hours.

Since the 6 May 1963 meeting, which marked the implementation of corrective action, approximately 180 hours of installed J58 engine time has been accumulated. During this current period, five J58 engines suffered FOD with one of these resulting in major damage. This reflects a mean time between J58 FOD of 24.0 hours and a mean time between major J58 FOD of 120 hours.

5. Original reports indicated that two J58 engines sustained FOD on 6 August in aircraft #122 during pre-flight ground runs after extensive

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Inlet duct modifications made for the purpose of exploring a redistribution of airflow designed to improve the aircraft "roughness" phenomenon associated with the airflow mis-match problem. Later reports, however, indicate that these damages were internally induced by the engines and therefore they are not considered as foreign object damages. Engine inspection so far has not firmly determined this point although indications point to the engine itself as the ultimate cause.

Headquarters position, however, as presented to Lockheed by the Headquarters FOD Committee representative prior to the above ground run, was and still is one of strong concern in that the inlet nacelle modifications to this aircraft have resulted in a configuration vastly more susceptible to FOD than existed prior to the modifications. Mr. Johnson personally has been made aware of this concern and has been acquainted with the recommended steps to reduce the susceptibility to damage.

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Aircraft Systems Division
(Special Activities)

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ASD/OSA:mvp (8 Aug 63)

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